18

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09/405,237	09/23/1999	JOHN K. RENWICK	IBN-0014	9267

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EXAMINER	
MOLINARI, MICHAEL J	

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2665	

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18

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	09/405,237	RENWICK ET AL.
	Examiner	Art Unit
	Michael J Molinari	2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,9,10,12-15 and 26-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,9,10,12-15 and 26-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 10 recites the limitation that the logical operation is performed on an address field in the packet. However, claim 10 depends from claim 1, which recites performing a logical operation on a protocol field of the packet. The specification of the instant application explains that the logical operation can be performed on either the address field or the protocol field, but fails to disclose performing the logical operation on both fields. As such, claim 10, which claims performing logical operations on both fields, is not properly enabled by the specification.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 12 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Lines 14-15 of claim 12 and lines 16-17 of claim 26 recite the limitation that the response signal "includes a label word which defines a plurality of bits",

which is unclear. Normally, in the art, pluralities of bits define label words, not the other way around.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-4, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rekhter et al. ("Tag Switching Architecture") in view of Davie et al. ("Explicit Route Support in MPLS"), further in view of Semeria ("Multiprotocol Label Switching: Enhancing Routing in the New Public Network").

1. Referring to claim 1, Rekhter et al. disclose a method of forwarding data over a network from a source node to a destination node, comprising: providing a subnetwork (domain, see page 4, column 1, lines 30-31) within the network having a label-switched network (see page 1, column 2, lines 19-22) and a plurality of subnetwork nodes (switches, see page 2, column 1, lines 14-16) connected by a plurality of subnetwork links (see page 5, column 1, lines 22-24), the subnetwork nodes including an ingress node (see page 4, column 2, lines 13-16) and an egress node (see page 4, column 2, lines 16-21) coupled to the source node and the destination node, respectively, at least one pair of subnetwork nodes being connected by a plurality of subnetwork links, the plurality of subnetwork nodes and the plurality of subnetwork links defining a plurality

of subnetwork paths (routes, see page 2, column 2, lines 29-30) between the ingress node and the egress node; and associating each packet of data to be transferred from a particular source node to a particular destination node with one of the plurality of paths between the ingress node and the egress node (see page 2, lines 13-32); and performing a logical operation on information carried in each packet of data; wherein the logical operation is performed on a protocol field in the packet of data (see page 2, column 2, lines 16-17 and page 5, column 1, lines 38-46 and column 2, lines 1-43. Note that it is well known in ATM to modify the VPI/VCI fields in ATM cell headers as they are passed from switch to switch). Rekhter et al. disclose the use of explicit routes in MPLS but differ from claim 1 in that they do not teach the details of how explicit routes in MPLS work. However, the use of explicit routes in MPLS is well known in the art. For example, Davie et al. disclose forwarding a signal (RSVP path message, see page 3, lines 24-25) from the ingress node (first node, see page 3, lines 18-20) to the egress node (last node, see page 3, lines 18-20) along a route through a subset of subnetwork nodes (the subset of subnetwork nodes is made up of the nodes of the ER-LSP, see page 3, lines 32-36) between the ingress node and the egress node, said signal requesting a response from each node along the route (see page 3, lines 33-34); and receiving response signals from the nodes along the route (the response signals are contained within the RESV message, see page 3, lines 37-40 and page 4, lines 1-6), the response signals defining a path within the route between the ingress node and the egress node as being how explicit routing works in a tag switching (MPLS) network. One skilled in the art would have recognized the advantage of explicit routes as taught by Davie et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the implementation of explicit routes in MPLS as taught by Davie et al. into the

MPLS method of Rekhter et al. to achieve the advantage of implementing explicit routes (which have the advantage of enabling ISPs to have greater control over QoS in their networks). Rekhter et al. in view of Davie et al. differ from claim 1 in that they fail to disclose the creation of multiple paths between the ingress node and the egress node. However, this is also well known in the art. For example, Semeria teaches the provision of multiple LSPs between each pair of edge LSRs (see page 16, lines 23-26), which has the advantage of providing better QoS in the network. One skilled in the art would have recognized the advantage of provisioning multiple LSPs between each pair of edge LSRs as taught by Semeria. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the use of multiple LSPs between each pair of LSRs as taught by Semeria into the invention of Rekhter et al. in view of Davie et al. to achieve the advantage of providing better QoS in the network.

2. Referring to claim 3, Rekhter et al. disclose that the network comprises nodes (switches) which forward data using Internet protocol node addresses (see page 1, column 2, lines 4-9 and page 3, column 1, lines 8-12).

3. Referring to claim 4, Davie et al. disclose that each subnetwork node along the route allocates a plurality of labels for the plurality of paths along the route (see page 3, lines 39-40 and page 4, lines 1-2. Note that each path has its own label. Therefore, a plurality of paths inherently includes a plurality of labels).

4. Referring to claim 10, Semeria discloses that the logical operation is performed on an address field in the packet of data (see page 4, lines 21-26).

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rekhter et al. ("Tag Switching Architecture") in view of Davie et al. ("Explicit Route Support in MPLS"), further in view of Semeria ("Multiprotocol Label Switching: Enhancing Routing in the New Public Network") as applied to claim 8 above, and further in view of Woodcock et al. ("Microsoft Press Computer Dictionary").

6. Referring to claim 9, Rekhter et al. disclose the method of claim 8 above, but fail to disclose that the logical operation comprises a hash function. However, the use of hash functions in accessing tables of data (such as routing tables) is well known in the art. For example, Woodcock et al. teach the use of hashing to find an element in a list, which has the advantage of being highly efficient. One skilled in the art would have recognized the advantage of hashing as taught by Woodcock et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the use of hashing as taught by Woodcock et al. into the invention of Rekhter et al. in view of Davie et al., further in view of Semeria to achieve the advantage of making the TIB table lookups highly efficient.

7. Referring to claim 12, Rekhter et al. disclose a method of forwarding data over a network from a source node to a destination node, comprising: providing a subnetwork (domain, see page 4, column 1, lines 30-31) within the network having a plurality of subnetwork nodes (switches, see page 2, column 1, lines 14-16) connected by a plurality of subnetwork links (see page 5, column 1, lines 22-24), the subnetwork nodes including an ingress node (see page 4, column 2, lines 13-16) and an egress node (see page 4, column 2, lines 16-21) coupled to the source node and the destination node, respectively, at least one pair of subnetwork nodes being connected by a plurality of subnetwork links, the plurality of subnetwork nodes and the plurality of

subnetwork links defining a plurality of subnetwork paths (routes, see page 2, column 2, lines 29-30) between the ingress node and the egress node; wherein the subnetwork comprises a label-switching network (see page 1, column 2, lines 19-22). Rekhter et al. disclose the use of explicit routes in MPLS but differ from claim 1 in that they do not teach the details of how explicit routes in MPLS work. However, the use of explicit routes in MPLS is well known in the art. For example, Davie et al. disclose forwarding a signal (RSVP path message, see page 3, lines 24-25) from the ingress node (first node, see page 3, lines 18-20) to the egress node (last node, see page 3, lines 18-20) along a route through a subset of subnetwork nodes (the subset of subnetwork nodes is made up of the nodes of the ER-LSP, see page 3, lines 32-36) between the ingress node and the egress node, said signal requesting a response from each node along the route (see page 3, lines 33-34); and receiving response signals from the nodes along the route (the response signals are contained within the RESV message, see page 3, lines 37-40 and page 4, lines 1-6), the response signals defining a path within the route between the ingress node and the egress node as being how explicit routing works in a tag switching (MPLS) network. One skilled in the art would have recognized the advantage of explicit routes as taught by Davie et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the implementation of explicit routes in MPLS as taught by Davie et al. into the MPLS method of Rekhter et al. to achieve the advantage of implementing explicit routes (which have the advantage of enabling ISPs to have greater control over QoS in their networks). Davie et al. further disclose that a response signal includes a label word which defines a plurality of data bits, a first subset of the defined data bits being associated with the route between the ingress node and the egress node and a second subset of the defined data bits being associated

with the plurality of paths within the route. All messages in the network contain label words and data bits, and these can be divided into subsets, and they are associated with the routes and the plurality of paths by being contained in responses that are carried in the same subnetwork as the route and the paths. Rekhter et al. in view of Davie et al. differ from claim 1 in that they fail to disclose the creation of multiple paths between the ingress node and the egress node. However, this is also well known in the art. For example, Semeria teaches the provision of multiple LSPs between each pair of edge LSRs (see page 16, lines 23-26), which has the advantage of providing better QoS in the network. One skilled in the art would have recognized the advantage of provisioning multiple LSPs between each pair of edge LSRs as taught by Semeria. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the use of multiple LSPs between each pair of LSRs as taught by Semeria into the invention of Rekhter et al. in view of Davie et al. to achieve the advantage of providing better QoS in the network.

8. Referring to claim 13, Davie et al. disclose that the data bits of the second subset of the defined data bits are not assigned values by the node that generated the response signal. Certain bits in each packet could be assigned by any of the nodes along the path of the signal.

9. Referring to claims 14-15, it is well known in the art to use a variable number of data bits to determines a variable number of paths, routes, or addresses, and it is also well known that the number of bits required to label N routes is n, where N = 2 to the n power.

10. Referring to claim 20, Rekhter et al. disclose an apparatus for forwarding data over a network from a source node to a destination node, comprising: a subnetwork (domain, see page 4, column 1, lines 30-31) within the network having a plurality of subnetwork nodes (switches,

see page 2, column 1, lines 14-16) connected by a plurality of subnetwork links (see page 5, column 1, lines 22-24), the subnetwork nodes including an ingress node (see page 4, column 2, lines 13-16) and an egress node (see page 4, column 2, lines 16-21) coupled to the source node and the destination node, respectively, at least one pair of subnetwork nodes being connected by a plurality of subnetwork links, the plurality of subnetwork nodes and the plurality of subnetwork links defining a plurality of subnetwork paths (routes, see page 2, column 2, lines 29-30) between the ingress node and the egress node. Rekhter et al. disclose the use of explicit routes in MPLS but differ from claim 20 in that they do not teach the details of how explicit routes in MPLS work. However, the use of explicit routes in MPLS is well known in the art. For example, Davie et al. disclose a communication subsystem within the subnetwork for (i) forwarding a signal (RSVP path message, see page 3, lines 24-25) from the ingress node to the egress node along a route through a subset of subnetwork nodes (the subset of network nodes is made up of the nodes of the ER-LSP, see page 3, lines 32-36) between the ingress node (first node, see page 3, lines 18-20) and the egress node (last node, see page 3, lines 18-20), said signal requesting a response from each node along the route (see page 3, lines 33-34), and (ii) forwarding response signals from the subnetwork nodes along the route (the response signals are contained within the RESV message, see page 3, lines 37-40 and page 4, lines 1-6), the response signals defining a path within the route between the ingress node and the egress node as being how explicit routing works in a tag switching (MPLS) network. One skilled in the art would have recognized the advantage of explicit routes as taught by Davie et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the implementation of explicit routes in MPLS as taught by Davie et al. into the

MPLS method of Rekhter et al. to achieve the advantage of implementing explicit routes (which have the advantage of enabling ISPs to have greater control over QoS in their networks). Davie et al. further disclose that a response signal includes a label word which defines a plurality of data bits, a first subset of the defined data bits being associated with the route between the ingress node and the egress node and a second subset of the defined data bits being associated with the plurality of paths within the route. All messages in the network contain label words and data bits, and these can be divided into subsets, and they are associated with the routes and the plurality of paths by being contained in responses that are carried in the same subnetwork as the route and the paths. Rekhter et al. in view of Davie et al. differ from claim 20 in that they fail to disclose the creation of multiple paths between the ingress node and the egress node. However, this is also well known in the art. For example, Semeria teaches the provision of multiple LSPs between each pair of edge LSRs (see page 16, lines 23-26), which has the advantage of providing better QoS in the network. One skilled in the art would have recognized the advantage of provisioning multiple LSPs between each pair of edge LSRs as taught by Semeria. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the use of multiple LSPs between each pair of LSRs as taught by Semeria into the invention of Rekhter et al. in view of Davie et al. to achieve the advantage of providing better QoS in the network. Rekhter et al. further disclose that the network comprises a label-switching (label-swapping) network (see page 1, column 2, lines 19-22).

11. Referring to claim 27, Davie et al. disclose that the data bits of the second subset of the defined data bits are not assigned values by the node that generated the response signal. Certain bits in each packet could be assigned by any of the nodes along the path of the signal.

12. Referring to claim 28, it is well known in the art to use a variable number of data bits to determines a variable number of paths, routes, or addresses.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. U.S. Patent No. 5,473,607 to Hausman et al. teaches a method of performing packet filtering in a data network.

7. U.S. Patent No. 5,414,704 to Spinney teaches a method of using hashing to perform address lookup in packet data communications.

8. U.S. Patent No. 6,173,384 to Weaver teaches a method of searching for a data element in a data structure.

9. U.S. Patent No. 6,359,886 to Ujihara et al. teaches a method of filtering and routing communications frames.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Molinari whose telephone number is (703) 305-5742. The examiner can normally be reached on Monday-Friday 9am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

mjm

Michael Joseph Molinari

ALPUS H. HSU
PRIMARY EXAMINER